Railway Electrification Power Systems

Project Development
Consulting
Systems Integration

DB. On track for tomorrow.
Modern technical facilities with high availability are, in addition to attractive transport solutions, a further basic prerequisite for efficient long-distance, regional and local transport. DB International has specialised in conceiving such systems for various electricity and power feed systems, running speeds and technical equipment.

For local and long-distance passenger services and freight transport, we prepare studies, professional opinions and design documents for electric rail systems for both existing and prognostic traffic solutions, paying special attention to system-related technical dependencies. We provide competent, comprehensive advice for new construction, upgrading, reconstruction or extension of railway and local transport systems, including corresponding stations, depots and workshops, taking into consideration economical and technical variations.

With our worldwide acknowledged technical know-how, we are able to investigate technical facilities with regard to their feasibility, make a detailed new design, and carry out the tendering activities and providing on-going support throughout implementation. We offer our knowledge on the various energy supply and electrification systems to both national and international railway and local transport undertakings, manufacturing companies and financial institutions. This applies to electro-technical systems for long-distance and regional railways, suburban railway systems, underground railways, dual or multi-system urban transit railways and trams or buses for above or underground networks. For certain specialised topics, DB International works together with specialist in DB-Group (German Railways), resulting in future-oriented and integrated electrified rail systems. As far as existing systems are concerned, we are able to combine the current equipment with state-of-the-art components to form a safe and reliable overall system. The construction of new facilities and renewal of existing installations can require many interim phases in the interests of safe operating procedures. These we design using the vast experience gained over the years in national and international projects in order to ensure an absolute minimum impact on operations. Electric facilities generate electromagnetic emissions. Our electromagnetic compatibility experts carry out the necessary analysis in order to detect causes of interference and minimise the effects ensuring that electric rail systems are designed and executed in conformance with legal requirements and prevailing standards.

DB International offers a comprehensive range of services, extending from advice and basic evaluation via individual design phases and implementation steps through to acceptance procedures and commissioning. Construction supervision and project management ensure a design conform implementation of the project. We provide our customers with experienced project managers, and also take on corresponding services for facility management and operation. In this overall framework of process orientation, we offer all design and consulting services from a single source including, according to requirements, operation, maintenance and continuous availability of electrified railway systems.
Catenary equipment (AC/DC)
- Overhead catenary system
- Systems for local and long distance traffic, incl. high speed catenary equipment
- Special catenary constructions (catenary wire stroke facilities, removable catenaries at flexible bridges, special construction for depots and workshops)
- System change sites
- Overhead conductor rail
- Third rail (3rd. Rail)

Substations and switching stations (AC/DC)
- AC-Substations
- DC-Substations
- Switching and paralleling points

Power supply energy distribution installations
- High voltage installations
- Medium voltage installations
- Low voltage installations

Power supply energy application installations
- Electrical switch heating
- Electrical pre-heating equipment for trains
- Technical building equipment
- Lighting installations

Electromagnetic compatibility (EMC)
- Precautions
- Earthing and potential equalisation
- Lightning protection
- Interference calculation and simulation
- Measurements

Further systems
- Remote control equipment (SCADA), Network control station
- Protective measures for persons and installations
Services

Project conception
- Definition of strategy and project goal
- Feasibility study
- Economic analysis
- Financing concept
- Personnel planning and development
- Project organisation

Systems dimensioning
- Simulations calculation for railway networks
- Dimensioning of traction power facilities
- Calculations of power loss, short circuit current and protection settings
- Load calculations for depots and workshops
- Parallel operations of direct current (DC) and alternating current (AC) operated railways

Project management
- Overall project organisation
- On site project management
- Financial coordination
- Reporting and documentation

Project implementation
- Site management
- On site construction supervision
- Acceptance and commissioning
- Object supervision and documentation

Taking over responsibilities for operations
- Operation control
- Facility management
- Instruction/training

Engineering design
- Railway power supply
- Catenary equipment
- Electro-technical installations
- Electromagnetic compatibility
- Architecture and structural design incl. technical building equipment
- Structural engineering
- Noise insulation
- Environmental protection, compensation area for wildlife and biotope protection

Acceptance and commissioning
- Technical plan verification
- Assistance at factory acceptance tests (FAT)
- Preparation of commissioning concept
- Coordination of the commissioning
- Inspection and technical commissioning
- Authorised Body inspection/acceptance, consulting

Electromagnetic compatibility/electrical safety
- Electromagnetic site survey
- Elaboration of concept designs EMC
- Measurements, site supervision and monitoring to attest compliance of EMC measures with requirements as defined in standards and regulations
- Technical investigation to determine the cause of damage
- Professional opinion reports for insurances and litigations

Further services
- Inspection, professional opinion, technical approval
- Contaminated sites/waste
- Geotechnics, hydrogeology, survey
Photos

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